The Economic Impacts of Biodiversity Protection: The Case of the Northern Spotted Owl and the Northwest Forest Plan

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The 1992 Northwest Forest Plan (NWFP) reallocated 12 million acres of Pacific Northwest public land from producing timber to protecting biodiversity. To explore the NWFP's economic consequences, we estimate simultaneous net migration and employment growth equations for 79 Oregon, Washington, and Northern California counties. We find significant and postive, but small, NWFP effects for both net migration and employment growth.

In the early 1990s, federal land managers reversed their 50-year policy of converting most Pacific Northwest (PNW) ancient forests to even-age, monoculture, short-rotation plantations devoted to timber production. This policy had converted nearly 90 percent of PNW ancient forests. Instead, under the Northwest Forest Plan (NWFP), management objectives for nearly 12 million acres of public land were refocused on ecosystem services, primarily habitat for threatened or endangered species such as the northern spotted owl, marbled murrelet, and numerous stocks of Pacific salmon and steelhead.

The NWFP threatened large impacts on the traditionally timber-dependent PNW. Federal timber harvests fell over 90 percent and overall harvests (from federal, state, tribal, and private lands) fell over 40 percent. Many analysts predicted severe economic dislocation, including negative economic growth and employment losses ranging from 3,000 to 30,000 jobs.

Others, however, expressed less concern, arguing that the public domain's production of timber, minerals, grazing, and other commodities no longer fueled the economies of western states. Indeed, some contended that subsidized commodity production, and the attendant negative externalities, inhibited economic growth. Rather, using public land to produce ecosystem services and environmental amenities will encourage in-migration, entrepreneurship, job creation, and economic growth.

Earlier studies of the economic effects of devoting public land to ecosystem services and environmental amenities found no effects, or small positive ones. However, these findings may arise from only small reallocations of only marginally productive lands, the "rocks and ice" of wilderness areas, for example.

In contrast, NWFP reallocations were not small, representing nearly 50 percent of public land in

Oregon, Washington, and Northern California and over 60 percent of total (public and private) land in many PNW counties. Moreover, the reallocated land included some of the world's most productive timberland.

The massive and sudden changes wrought by the NWFP provide an ideal natural experiment in the economic impacts of redirecting natural resource use from commodity to ecosystem services production. Sufficient time has elapsed to begin to evaluate the experimental results.

To do so, we estimate simultaneous net migration and employment growth equations for 79 counties in Oregon, Washington, and Northern California. The focus explanatory variables are both the proportion of total county land allocated to wilderness prior to the NWFP and the proportion reallocated from timber to biodiversity protection by the NWFP. Other determinants include factors affecting labor markets (e.g. workforce education levels) and net migration (e.g. crime rates). For comparison, we estimate equations for three time periods: 1980-1990, before the NWFP; 1990-1995, during the height of NWFP reallocations and timber supply disruptions; and 1995-2000, after long-run adjustments are more likely to have occurred. Simultaneous equation estimation allows us to estimate both direct and indirect NWFP effects. For example, land reallocations may directly influence employment growth by shifting the supply of timber and also may affect net migration, which, in turn, affects labor demand and supply.

The following findings are preliminary:

1. 1980-1990 estimates suggest that wilderness land had no significant direct effect on employment growth and a small, but significant, net migration effect. Direct plus indirect effect estimates suggest wilderness areas had a small, positive effect on employment growth and net migration.
2. 1990-1995 estimates confirm forecasts of negative direct NWFP effects on employment growth and suggest positive net migration effects. The estimated direct plus indirect NWFP effects on employment growth are negative and statistically significant, but small.
3. 1995-2000 estimates suggest a positive direct NWFP effect on net migration and no direct effect on employment growth. Estimated direct plus indirect NWFP effect on employment growth are significantly positive, but small in magnitude. The direct plus indirect effect on net migration is significantly positive and substantive in magnitude.